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How does phonemic awareness affect reading ability with at-risk students on the primary level

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HOW DOES PHONEMIC AWARENESS AFFECT READING ABILITY WITH AT-RISK STUDENTS ON THE PRIMARY LEVEL

by
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A Thesis

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Professor

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ABSTRACT

Author: Denise D. Layne

Title: How does phonemic awareness affect reading ability with at-risk students on the primary level?

Date: May 8, 1997

Advisor: S. Jay Kuder, Ed. D.

Program: Special Education

Purpose: To examine if at-risk primary students' reading ability will increase through supplementation of the reading curriculum using phonological activities.

Abstract: This study examined how phonemic awareness affects reading ability with at-risk students on the primary level. Subjects were from two second grade classes at an elementary school. Phonological activities were provided during 30 minute class periods 5 times each week for 10 weeks. Instruction centered on finding words that rhyme, words with same blends and words with vowel sounds. Subjects completed a pre and post-test using the Yopp-Singer Test of Phoneme Segmentation. Findings suggest that both groups scores increased on the post-testing. But the experimental group improved 76.4% greater than the control group.

MINI-ABSTRACT

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Title: How does phonemic awareness affect reading ability with at-risk students on the primary level?

Date: May 8, 1997

Advisor: S. Jay Kuder, Ed. D.

Program: Special Education

Abstract: This study examined the effect of phonemic awareness training on the reading ability of at-risk students on the primary level. Average scores from pre and post-testing increased for both the control group and the experimental group. Post-test scores for the experimental group having phonemic awareness sessions were significantly higher.

Chapter One

Title: How Does Phonemic Awareness Affect Reading Ability with At-Risk Students on the Primary Level.

Introduction:

Concern about the acquisition of reading skills in the primary grades is widespread. It appears that reading is not a priority in many homes. Although children are encouraged to attend school on a daily basis, print is not easily accessible nor stressed in the daily lives of many children. Children are not encouraged by parents to utilize the printed word which would enable them to internalize reading skills.

Recent research indicates that a major cause of decoding disabilities lies in an inability to manipulate speech at its phonological level. Early stimulation of phonological awareness in the kindergarten years assists the subsequent development of the decoding process in groups of normal and at-risk children. Recent work in phonological awareness makes it clear that more than phonics is required. There is a "missing link" at a more basic level of processing for many students (Truch, 1994).

Having taught reading for three years, I believe phonology is an essential ingredient in the reading process. I have found that many of my students have difficulty breaking words down into phonemes. They have not internalized sounds associated with letters to enable the decoding process to appear fluid. Prior study of language skills does not appear to carry over for the application level. Research reinforces the fact that instruction improves phonological abilities which then carried over to both reading and

spelling. Children whose phonological skills were initially low, achieved a level of phonological awareness comparable to that of naturally proficient children, but were still efficient in learning to read (O'Connor, 1994).

Research on phonemic awareness and reading has found that children with poor phonological skills are at risk in reading. In addition, most of the children at my school are on a lower socioeconomic level, substantiated by the fact that 70% of my children qualify for the U.S. government subsidized programs. Given these factors, I feel it is critical that children develop phonemic awareness since it is an essential element in the reading process.

Theory

Lack of phonemic awareness is common among at-risk children. Many of these children hesitate when they encounter an unfamiliar word in the text. They try to articulate each letter while being unsure what sounds the letters make. Even when the children are encouraged to articulate words, they will not continue reading until the word is pronounced for them. Retention of letter sounds are not internalized. This presents a problem for these at-risk students because they get further behind developmentally, but continually keep moving up to higher grades. At-risk students usually continue to be poor readers throughout life.

Skillful readers attack each individual letter or groups of letters. They may hesitate when encountering an unfamiliar word in the text, but have internalized the necessary skills to decode the phonemes of a word.

Studies have indicated that the ability to grasp phonemic segmentation is a prerequisite for linking sounds to corresponding letters and subsequent word identification. Poor readers benefited from phonemic segmentation training with positive effects on ability to identify words. Results have concluded that ease of segmentation is causally related and is not a consequence of reading.

Although many reading programs have a phonics component built in, there is lack of training in encoding and retrieval to enable at-risk readers to decode words. David Share (1995) has pointed out in his research that not just direct instruction and contextual guessing should be taught but also the self-teaching mechanism. Through the self-teaching mechanism, students are able to identify unfamiliar words by applying the rules of phonemes.

Purpose of Study

The purpose of this study is to determine whether supplementation of phonological skills training will enable at-risk readers to be better decoders and readers. The findings of this study will help me to decipher whether or not continuing to supplement phonological skills is an effective strategy for students with reading difficulties.

Research Questions

To accomplish the general purpose of this study, the data obtained will be used to answer the following questions:

1. Does phonological awareness affect reading ability in at-risk students on the primary level?
2. How effective is phonological processing on the enhancement of reading ability?

Hypothesis

The hypothesis for this study is that phonemic awareness among at-risk students increases reading ability when given supplemental activities of breaking words into phonemes. The null hypothesis is that phonemic awareness among at-risk students does not increase.

Limitations

This study is limited in that it involves nine students in one second grade class. The sample size was not random ,but one of convenience. There was no control over what the children did at home or outside the classroom. All students agreed willfully to

participate in the study. Only one category of the test was used due to accessibility. These students fell within the lower quartile in reading based on their scores on the Iowa Test of Basic Skills. This study determines how phonemic awareness effects reading ability with at-risk students on the primary level.

Definitions of Terms

Phonological awareness - conscious ability to detect and manipulate sound (e.g., move, combine, delete), access to the sound structure of language, awareness of sounds in spoken words in contrast to written words (Smith, 1995).

Phonological processing - the use of phonology or sounds of language to process verbal information in oral or written form in short and long term memory. Components include awareness of coding verbal information only (Smith, 1995).

Decoding - translating individual letters and or groups of letters into sounds to access the pronunciation of a word (Smith, 1995).

Phonemes - individual sounds, smallest unit of sound (Smith, 1995).

Phonological analysis - is explicit identification of individual phonemes in words (Torgesen, 1992).

Phonological synthesis - ability to combine a sequence of isolated phonemes together to produce a recognizable word, sound blending (Torgesen, 1992).

At-risk - students who are in failure of academic success.

Chapter Two

Review of Literature

When most children enter kindergarten, they have a substantial vocabulary and adequate syntax. They can also pronounce most of the sounds clearly. The ingredient they lack is phonemic awareness, an understanding that speech is composed of a series of individual sounds. Young children are not aware that the spoken sound /r/-/a/-/t/ is a set of sounds or phonemes.

Tasks can determine whether or not a child is phonemically aware. One task involves giving separate sounds for a word such as cat /c/-/a/-/t/. Another task would be for the child to say the beginning, middle, or ending sound of a word. Children who can perform the task of segmenting utterances or sounds successfully, have control over the smallest units in their speech which are phonemes.

Phonemic awareness tasks are not easy to perform. Children have to analyze or manipulate the units of speech; not focus on the meaning of a word. Phonemes are not discrete units of speech, but are encoded at the acoustic level into larger units, approximately syllabic size (Yopp, 1992). Phonemes are abstract because they are not marked by physical definable boundaries. Sometimes pure syllables are not heard. The phoneme /d/ will have a slightly different sound when followed by /oo/ than by /i/.

The relationship between phonemic awareness and learning to read can be stated in a couple of ways. First, phonemic awareness is a consequence of learning to read. Second, phonemic awareness is a prerequisite of learning to read. There is substantial

evidence that some level of phonemic awareness is a prerequisite to learning to read. The relationship is most likely a reciprocal cause. In order to benefit from formal reading instruction, children must have a certain level of phonemic awareness. Reading instruction heightens their awareness of language. Therefore, phonemic awareness is both a prerequisite for and a consequence of learning to read. Yopp states that phonemic awareness may be the most important core and causal factor separating normal and disabled readers. Yopp also states that phonemic awareness can be taught through vigorous training programs or in a less direct, more natural way by providing children with language rich environments through word play in stories, songs and games. Findings have indicated that training results in significant increases in phonemic awareness.

A study by Lundberg (1988) was conducted by training 235 kindergartners in 12 different classrooms. The children were from a lower socioeconomic working class population and were 6 years of age. There were 15 to 20 minute daily training sessions that lasted from September to May. The goal of the training was to guide the children to discover and attend to the phonological structure of language through exercises and games. A control group of 155 kindergarten children participated in the regular kindergarten curriculum.

All children were pre-tested on a series of phonemic awareness tasks at the beginning of the school year. Post-tests revealed that the experimental group of kindergartners progressed more than the children who did not have the phonemic awareness training. When the children were tested again in the beginning of first grade, the trained children still performed significantly better than the control group. The

children who received the training also outperformed the control group when given a reading achievement test in the first grade. This study concluded that training in phonemic awareness can be very effective and successful.

In Connie Juel's study (1988), the progress of learning to read was examined in 54 children from first through fourth grade. Juel questioned what skills do poor readers lack and do the same children remain poor readers year after year. She stated that learning to break the code of written text is partly dependent on being aware that words are made of sequences of meaningless and somewhat distinct sounds which are phonemes. This is not necessary for understanding or producing speech but is necessary in learning to decode an alphabetic language. Juel found that phonics instruction is not effective unless children have some phonemic awareness at the beginning of first grade. She also stated that low economic status Black and Hispanic children are more likely to have poor phonemic awareness of school English which hinders the development of decoding skills.

In Juel's experiment, the subjects attended a large elementary school and lived in a low socioeconomic, transient area. Data on the 54 children was obtained from first through fourth grade. Each child in first grade was given a series of the following tests: Bryant Test of Basic Decoding Skills, Wide Range Achievement Test (WRAT) - reading sub-test, word recognition, and spelling, Iowa Test of Basic Skills - reading comprehension and a writing sample that was holistically scored. These children were tested each year to see if their scores increased. The scores steadily increased each year but were below the 50th percentile. A primary factor that was keeping the poor readers from improving greatly was their poor decoding skills. It appeared that their poor skills

were a result of lack of exposure to phonemic awareness and lack of reading. Juel concluded that children in a low socioeconomic status need to be exposed to language rich environments or a reading program focusing on implementation of sounds or they will continue to be poor readers.

Phonological awareness skills involve analysis and syntheses skills. Phonological analysis or phoneme segmentation involves explicit identification of individual phonemes in words. Analytic skills require the child to identify a word that begins with the same sound as a target word. A more difficult task would be pronouncing each phoneme in isolation. Phonological synthesis is the ability to combine a sequence of isolated phonemes together to produce a recognizable word, which is sound blending.

According to Torgesen et others (1992), performance on both analysis and synthesis tasks are highly correlated with the acquisition of reading skills. Torgesen stated that synthesis skills play a more causal role in early reading development than analysis skills. One hundred forty-three children from seven kindergarten classes were pre-tested using the Screening Test of Phonological Awareness (STOPA). The STOPA pre-test measures involved phoneme segmentation, phoneme blending, measure of alphabetic reading and general verbal ability.

The subjects were divided into three groups: Group 1 which received phonological awareness training including analysis and synthesis or blending activities, Group 2 which received training in only blending activities and Group 3 the control group which received a variety of language experience activities. Groups 1 and 2 received warm-up sessions consisting of beginning sound games and activities designed to help learn to segment and

blend individual words. The children were taught to identify and pronounce beginning, ending, and middle sounds in two or three phoneme words. They were taught to pronounce all the sounds of the words and then were taught to pronounce words after hearing the phonemes presented in sequence. The control group listened to stories, discussed the pictures and events, answered comprehension questions, role played events from the stories, and shared personal experiences related to the events.

Post-tests were administered to all three groups. The training program did produce significant improvements in the children's ability to segment phonemes. Group 2, blending only, learned to blend phonemes into words with a high degree of proficiency. The control group's scores stayed within the same range after the language experience activities. The conclusion of the study states that phonological awareness training results in better awareness of how words are composed and lead to better word learning and decoding skills in reading.

Janet Spector alleged (1992) that correlational and experimental studies have shown that students who enter reading instruction unable to perform phonemic awareness tasks experience less success in reading than students who score high in phonemic awareness tasks. Her study focused on conventional assessment verses dynamic assessment. Conventional assessment tests of phonemic awareness result in too many false negatives on students who are unable to perform the experimental task but who actually may possess that ability.

In the dynamic assessment approach the examiner attempts to move the student from failure to success by modifying the format of the test by giving cues or prompts.

Thirty-eight kindergartners were assessed in the beginning of the school year on receptive vocabulary, letter and word recognition, invented spelling, phoneme segmentation, phoneme deletion and dynamic phoneme segmentation. The kindergartners were tested near the end of the school year. Results stated that the dynamic assessment was a good indicator of reading scores and growth in phonemic awareness.

Research has demonstrated that phonological awareness is as powerful a predictor of reading as is letter knowledge. The tasks used to test phonological awareness are on a continuum of complexity. Phonological tasks can be ranked as emerging, simple, or complex; or be ranked as having shallow or deep sensitivity. Invented spellings of preliterate children are also considered to be indicators of phonological awareness. Mann (1989) and her colleagues found that those kindergarten children who gave more phonologically accurate invented spellings were better first grade readers. These researchers interpreted children's invented spellings as ability to access the phonological structure of words.

Research on the relationship of phonological awareness to reading ability was done by Isabel Liberman and her colleagues. They demonstrated that approximately half of the preschool children they treated could not segment words by syllables, nor could they segment them by phonemes (Liberman and others, 1985). Liberman's research continued to say that phoneme segmentation continued to be difficult at the kindergarten level, but by the end of first grade 70 percent of the children were successful in segmenting words by phonemes. In Wagner and Torgesen's (1994) study, there has been controversy about whether phonemic awareness comes before reading ability and the causal role it plays in

reading development or whether the awareness of phonemes develops primarily as a result of reading experience. Wagner and Torgesen concluded that phonemic awareness appears to develop at about the age in which children learn to read.

Since there are many tasks used to test phonological awareness, it has been questioned whether phonological awareness is a single skill or whether there is more than one skill involved. When many different measures of phonological awareness are administered to kindergarten or first grade children, they are subjected to factor analysis, they tend to yield only one or two factors (Badian, 1994). Yopp's two factors were highly related. More difficult phoneme deletion measures loaded on one factor and measures of segmentation, sound isolation, blending, and phoneme counting on the other (Yopp, 1988).

Badian points out that many studies that test phonological awareness with reading ability are flawed because they do not control for differences in reading skills. Badian concluded that letter naming was found to be a predictor of first and third grade phonemic awareness and orthographic processing skills to later reading.

David Hurford and Raymond Sanders (1995) stated that although children with reading disabilities have serious deficits in phonological processing, they are not destitute of these skills. These children are less efficient in processing phonological material. The study was conducted to examine children's inclination to process visually presented phonological information in an auditory mode, even when the information does not require that it be processed in that way (Hurford and Sanders, 1995).

In their experiment, half of the children with reading disabilities were given an intervention designed to increase their ability to make discriminations between auditorially presented phonemes by focusing on the hypothesized intra-syllable processing deficit. The interventions controlled both stimulus complexity and reinforced immediate feedback concerning the student's performance. The intra-syllable intervention provided the student with experience processing phonological information in which there were not transitions. Hurford and Sander's study concluded that the phonemically trained post-training performance was significantly better than their pre-assessment performance. This same intervention has been found to be effective in improving other types of phonological abilities such as phoneme segmentation.

Rhyming and alliteration skills appear as the best predictor of later reading in the longitudinal study of Bradley and Bryant (1983). Rhyming has also been a good predictor in other longitudinal studies, and a link between auditory organizational skills and reading. The ability to attend to similarities and differences in the sounds of words may be important for noticing how the similarities and differences are represented alphabetically. A child who can hear that "cat" and "sat" rhyme should find it easy to understand that the spelling pattern at the end of these words are the same.

The argument against the link between rhyming and reading is that children's experience with rhymes may help them to make orthographic analogies when they begin learning to read. It is therefore possible that a child's rhyming ability is a good predictor of his or her later reading skill partly because rhyming leads a child naturally to use orthographic analogies (Goswami, 1990).

Their subjects consisted of 66 kindergartners that were given phonological tasks. The tasks consisted of detecting rhyme, alliteration and phonemes. The project was longitudinal and the results were from four sessions each approximately one year apart. Their results state that there is a connecting path from early sensitivity to rhyme continuing to awareness of phonemes a year or more later. This awareness of phonemes is strongly related to reading. Sensitivity to rhyme and alliteration are developmental precursors of phoneme detection, which in turn, play a considerable role in learning to read (Bryant and Bradley, 1983).

In Goswami's study (1990), the researchers hypothesized that children who are better at rhyming should be better at making orthographic analogies. Beginning and end analogies were included; a test of alliteration and rhymes were given as well. Phoneme deletion was also included in this study in order to make an analogy between "weak" and "beak". It requires initial phoneme deletion. Other non-phonological skills such as memory, verbal ability, and reading age were also examined.

Results concluded that both rhyming and analogy are linked because reading ability is a common factor to both. Rhyming ability is known to be an important indicator of later reading skill. Therefore it could be possible that better rhymers are better readers.

Wagner, Torgesen and Rashotte's (1994) views of phonological processing abilities coincide with the studies that were previously discussed. Three alternative views about the nature of causal relations between the development of phonological processing abilities and achievement in early reading and spelling of alphabetic languages are as follows (Wagner et al., 1994): The first view is that the development of phonological

processing abilities enables or at least facilitates the acquisition of beginning reading and spelling skills. Second, learning to read and spell enables or facilitates an awareness of the phonological structure of the oral language. The third alternative is that causal relations between phonological processing abilities and reading are bi-directional or reciprocal (Wagner et al., 1994).

The aim of Wagner, Torgesen and Rashotte's study was to examine the development of young children's phonological processing abilities and compare different views of causal relationships between phonological processing abilities and the acquisition of reading proficiency. The study tried to minimize model misspecifications in longitudinal correctional studies and extended previous research into a framework for conceptualizing phonological processing abilities.

Extensive research and studies state that there is a link between phonological processing and reading ability. Research has also proven that children who have strong phonetic skills are better readers. Although, children with reading disabilities can grasp the skills at a slower rate.

Chapter Three

Design of the Study

This study is a comparison of the effectiveness of phonemic awareness to reading ability with at-risk students on the primary level.

Subjects of the Study

The subjects of the study were selected by a sample of convenience and control. Westmoreland County has ranked below the 50th percentile on the Iowa Standardized Test in the areas of reading and math compared to five nearby rural counties. Sixteen second grade students were selected from one rural school in Westmoreland County in Hague, Virginia. The school population reflects the socioeconomic status of the farming and fishing community. This is determined by 70% of the students are eligible for various government subsidized programs.

The subjects from the experimental group are nine children between the ages of 7 and 8 years (mean age 7 years 7 months). There are 3 girls and 6 boys in the study. These students fall within the lower quartile of the class based on the Iowa Standardized Test of Achievement. One student was retained from the prior year. Eighty-eight percent of this group was African American.

The subjects from the control group are seven children between the ages of 7 and 8 years (mean age 7 years 8 months). There are 2 girls and 5 boys in the study. These

students also fall within the lower quartile of their class. Seventy-two percent of the group was African American.

Research Strategy

My class and another second grade class within the school were administered the Yopp-Singer Test of Phoneme Segmentation in December of 1996. This test was selected because each word has to be broken down into beginning, middle and ending sounds. The reliability of this test was calculated and a factor analysis was conducted to determine the validity. This test had a reliability score of 0.95. Therefore, it can be appropriately used in the assessment of individuals. Students in my class (experimental group) who received a score below 70% received additional phonological activities which supplemented the reading and language program. The other second grade students (control group) who received a score below 70% received no additional phonological activities. The purpose of the project was to determine whether the additional phonological activities had an impact on the students ability to decode and apply the skills to unknown words.

The control group participated in the normal second grade reading program as described below.

First, reading and language instruction was provided in class for ninety minute periods once a day. Instruction occurred at the same time each morning and centered on grammar, phonics, spelling, reading short stories, applying skills such as comprehension, sequencing, and cause and effect. Part of the instructional reading time was administered

by a reading specialist through the Title 1 Program. Since it is an inclusionary program, the students are not pulled out to receive remediation on basic skills which some have not mastered.

Second, spelling, phonics and short stories are part of the new literature series the county adopted by Harcourt Brace. The short stories within the series are more literature based, having a whole language style with phonics and spelling intertwined. Each story has activities where grammar skills; like verb usage and comprehension skills such as the main idea of a paragraph are applied. Spelling words are derived from the stories and used throughout the context. All the children are supposed to be reading on the same level of the series unlike the prior basal series they were exposed to last year in first grade, where students were reading on their own individual level.

Third, the Cognitive Process of Instruction (CPOI) Phonics program (which Westmoreland County implemented) was taught within the reading and language curriculum. This program focused on forming patterns and clusters within the mind in order for retention of information. There was a five step process which was repeated for each phonetic skill such as short and long vowel sounds. A five step process was implemented for each learned skill. The steps are as follows:

first - listening to the word,

second - saying the word,

third - doing a skill such as hearing the vowel sound or hearing a blend,

fourth - circling the vowel sound or the blend and

fifth - saying the word again. CPOI seems to touch the surface but does not get very deep into segmenting phonemes.

The experimental group participated in the above reading program with the following additional phonological activities.

Blending skills - involved students using pictures and words. The students had to write and say the missing blend. They were also given cards with words and blends to match, using differentiation.

Rhyming skills - involved students using words within a word family such as "an". They had to substitute beginning letters such as in "(c)an". When word cards were flashed, the students had to sound out the word.

Synthesis skills - involved students saying beginning, middle, and ending sounds of words. Words and pictures were presented. Students had to focus on the sounds that were being deleted.

Analysis skills - involved students identifying words that had the same beginning, middle, or ending sound as a target word.

Each skill was practiced once a week for thirty minutes for a ten week period. At the end of the ten weeks, both experimental and control groups were given the same Yopp-Singer Test of Phoneme Segmentation as a post-test. Prior to testing each student was advised information was being used for the examiner's use and would not reflect toward their grade. The following testing procedure was followed:

-Test was done on a one-to-one basis with the examiner.

- One class was completed each day. Testing was completed within two days for both groups (with no additional training for either group).

- Duration of the test was approximately ten minutes per student.

- Student was told to repeat the individual sounds they heard in each word.

- Student uttered the sounds of each word while examiner circled each correct response. Each incorrect response was recorded according to the test specification.

Chapter Four

The results of the pre and post-tests were analyzed and tabulated to obtain or answer the questions posed in Chapter 1:

1. Does phonological awareness effect reading ability in at-risk students on the primary level?
2. How effective is instruction in phonological processing on the enhancement of reading ability?

Analysis of Data

The results of the pre-intervention testing for the Yopp-Singer Test of Phonemic Segmentation are presented in Table 1. The mean for the experimental group was 12.6 (57.2%) with a standard deviation of 2.7 (12.2%). Raw scores ranged from a low of 7 (student 2) to a high of 15 (student 1 and 5). Percentile rank scores ranged from 32 to 68. The mean for the control group was 12.9 (58.2%) with a standard deviation of 1.6 (7.1%). Raw scores ranged from a low of 11 (student 4) to a high of 15 (student 5). Percentile rank scores ranged from 55 to 68. There was a narrower range of scores in the control group than in the experimental group. Mean scores of the two groups are within 1.2% of each other. Data shows the two groups are close to being equal. Gender and race breakdown are identified as follows:

Group	Male	Female	AA	C
Experimental	3	6	6	3
Control	5	2	5	2

The results of the post-intervention testing for the Yopp-Singer Test of Phoneme Segmentation are presented in Table II. The mean for the experimental group was 16.8 (75.9%) with a standard deviation of 2.5 (11.3%). Raw scores ranged from a low of 14 (students 6 and 7) to a high of 20 (students 1 and 3). Percentile rank scores ranged from 64 to 91. The mean of the control group was 15.2 (69%) with a standard deviation of 1.2 (5.4%). Raw scores ranged from a low of 13 (student 2) to a high of 17 (student 3). Percentile rank scores ranged from 59 to 77.

Table III presents the comparison of pre and post -test intervention results of the Yopp-Singer test. The mean increase of the raw scores for the experimental group was 4.2 (18.9%). Raw scores ranged from a low of 1 (student 7) to a high of 8 (student 2). The percent increase ranged from 7.7% to 114.2% (mean = 35.8%).

Raw scores of the control group increased from a low of 0 (students 2 and 5) to a high of 5 (student 6). The mean raw score increase was 2.3 (10.4%). Percent increase in raw scores ranged from 0 to 45.4 % (mean = 19.3%). The scores ranged from 59% to 77% (standard deviation = 5.4%). Although the control group did not get intervention, the scores increased from 0% to 23%.

Table IV presents reading scores for both classes which the control students and experimental students were selected. The scores were sorted by decreasing percentile for each period. The reading scores of the control group indicate the following:

First Period:

a) The selected control students are indicated by a "C" in the left column.

b) Except for one student (student 17), the students fell within the lower ranking of the class.

c) The mean class score was 83.0% with a standard deviation of 6.2%.

d) The reading percentile scores range from a low of 71 (student 19) to a high of 98 (student 3).

Second Period:

a) The class mean decreased to 81.4% with a standard deviation of 7.1.

b) The scores ranged from a low of 67 (student 5 and 7) to a high of 97 (student 3).

c) The control students were lowest in the class except for one (student 17).

d) Student 17 had decreased from the seventh position during the first period to the thirteenth position at the end of this period.

Third Period:

a) The class mean increased from 81.4% to 83.7% with a standard deviation of 7.1 and 7.6 respectively.

b) The control students had the lowest percentile ranking in the class. Student 17 decreased from the prior two periods to be grouped with the other control group students.

In Table IV the following was noted for the experimental group:

First Period:

a) The selected experimental students are indicated by an "E".

b) The class mean was 82.3% with a standard deviation of 9.4.

c) The reading percentile scores ranged from a low of 56 (student 17) to a high of 98 (student 13).

Second Period:

a) The mean score was 86.3% with a standard deviation of 7.7.

b) The reading scores ranged from a low of 67 (student 17) to a high of 97 (student 2 and student 13).

c) The mean score increased from 82.3% to 86.3% with the standard deviation of 9.4 and 7.7 respectively.

d) The lowest percentile score increased 11 points (student 17).

e) Student rankings increased from 11th, 13th, 14th, 16th, 17th, 18th, 19th, 20th, and 21st in the first period to 9th, 10th, 12th, 13th, 15th, 18th, 19th, 20th, and 21st during the second period.

Third Period:

a) The mean was 89.1% with a standard deviation of 4.8.

b) Reading scores ranged from a low of 74 (student 4) to a high of 94 (student 2).

d) The lowest percentile score increased 7 points above the second period (student 17).

e) The mean score increased from 86.3% to 89.3% as compared to the second period.

f) Student ranking was 5th, 8th, 10th, 11th, 12th, 17th, 19th, 20th, and 21st as compared to 11th, 13th, 14th, 16th, 17th, 18th, 19th, 20th, and 21st in the first period.

g) Student ranking was 5th, 8th, 10th, 11th, 12th, 17th, 19th, 20th, and 21st as compared to and 9th, 10th, 12th, 13th, 15th, 18th, 19th, 20th, and 21st during the second period.

Table V shows the reading scores of the control group and the experimental group for three periods. The scores are sorted by decreasing percentile for each period. The reading scores of the control group indicate the following:

First Period:

a) The mean was 76.3 with a standard deviation of 4.2.

b) The reading percentile scores ranged from 71 to 88.

c) Six students scored between 71% and 78% and one student scored 88%.

Second Period:

a) The mean was 71.9 with a standard deviation of 3.3. The mean score decreased by 4.4 points.

b) Reading scores ranged from 67% to 78%.

c) Two students scores were 67% while five students scored between 71% and 78%.

Third Period:

a) The mean was 72.9 with a standard deviation of 3.9.

b) The range of scores were 66%-83%.

c) Three student's reading scores gradually decreased each period.

d) Three students scores fluctuated between periods 1 and 3. Only one student's reading score increased each period.

In Table V the following was noted for the experimental group:

First Period:

a) Prior to the intervention the mean score was 72.9 with a standard deviation of 8.2.

b) Reading scores ranged from 56%-83%.

c) There was a 10 point difference between ranges of the control group and of the experimental group.

d) The mean score was 3.4% below the control group.

Second Period:

a) The mean was 81.3 with a standard deviation of 8.2.

b) The mean score increased by 8.4 points as compared to the first period.

c) The student's reading scores ranged from 67%-91%.

d) Five students had increased their score by 10 or more points.

e) The mean score increased to 9.4% above the control group.

Third Period:

a) The mean score was 86.6 with a standard deviation of 6.9.

b) The mean score increased 5.3 points from the second period.

c) The experimental group increased a total of 13.7 points as compared to the first period.

d) Students' reading scores ranged from 74%-91%.

e) Five students scored above the 90th percentile.

f) The lowest increase of a student was 10% from the first period to the third period (student 2).

g) The mean score increased to 13.7% above the control group.

Results of the Pre-Test Administration of the Yopp-Singer

Test of Phoneme Segmentation

Table 1

Experimental Group

Subject	Raw Score	Percentile	Gender/ Race
Student 1	15	68	M/C
Student 2	7	32	M/AA
Student 3	15	68	F/AA
Student 4	12	55	M/C
Student 5	15	68	M/AA
Student 6	10	45	M/C
Student 7	13	59	F/AA
Student 8	12	55	M/AA
Student 9	14	64	F/AA

Mean = 12.6 (57.2%)
Standard Deviation = 2.7 (12.2%)

Control Group

Student 1	12	55	F/AA
Student 2	13	59	F/C
Student 3	14	64	M/AA
Student 4	11	50	M/C
Student 5	15	68	M/AA
Student 6	11	50	M/AA
Student 7	14	64	M/AA

Mean = 12.9 (58.2%)
Standard Deviation = 1.6 (7.1%)
Gender: M = male; F = female
Race: C = Caucasian AA = African American

Results of the Post-Test Administration of the Yopp-Singer

Test of Phoneme Segmentation

Table II

Experimental Group

Subject	Raw Score	Percentile
Student 1	20	91
Student 2	15	68
Student 3	20	91
Student 4	15	68
Student 5	18	82
Student 6	14	64
Student 7	14	64
Student 8	19	86
Student 9	16	72

Mean = 16.8 (75.9%)
Standard Deviation = 2.5 (11.3%)

Control Group

Student 1	15	68
Student 2	13	59
Student 3	17	77
Student 4	15	68
Student 5	15	68
Student 6	16	73
Student 7	15	68

Mean = 15.2 (69%)
Standard Deviation = 1.2 (5.4%)

Comparison of Pre and Post-Test Results of the Yopp-Singer Test of Phoneme Segmentation

Table III

Experimental Group

Subject	Pre Score	Post Score	Increase in Raw Score	Percent Increase
Student 1	15	20	5	33.3
Student 2	7	15	8	114.2
Student 3	15	20	5	33.3
Student 4	12	15	3	25.0
Student 5	15	18	3	20.0
Student 6	10	14	4	40.0
Student 7	13	14	1	7.7
Student 8	12	19	7	58.3
Student 9	14	16	2	14.3
Mean			4.2 (18.9%)	38.5

Control Group

Student 1	12	15	3	25.0
Student 2	13	13	0	0.0
Student 3	14	17	3	21.4
Student 4	11	15	4	36.4
Student 5	15	15	0	0.0
Student 6	11	16	5	45.4
Student 7	14	15	1	7.1
Mean			2.3 (10.4%)	19.3

Reading Scores Sorted By Decreasing Order

Table IV

Control Class

	Student No:	First Period Scores (%)
	3	98
	14	91
	16	91
	13	89
	9	89
	15	89
C	17	88
	6	87
	8	87
	18	83
	20	83
	4	83
	10	79
C	12	78
	2	77
C	1	77
C	7	77
C	11	72
C	19	71
C	5	71
	Mean	83.0
	Std. Dev.	6.2

Control Class

	Student No:	Second Period Scores (%)
	3	97
	14	92
	13	92
	16	91
	6	89
	18	87
	20	85
	9	85
	8	83
	10	83
	4	82
	2	81
C	17	78
	15	77
C	12	76
C	19	73
C	1	71
C	11	71
C	7	67
C	5	67
		81.4
		7.1

Control Class

	Student No:	Third Period Scores (%)
	3	97
	14	93
	6	91
	8	91
	13	90
	20	90
	10	90
	15	90
	9	88
	16	87
	18	87
	4	85
	2	84
C	1	83
C	19	76
C	11	73
C	7	73
C	12	71
C	17	68
C	5	66
		83.7
		7.6

Experimental Class

	Student No:	First Period Scores (%)
	13	96
	9	96
	8	96
	2	94
	6	94
	11	94
	10	90
	21	89
	12	87
	14	83
E	15	83
	16	79
E	19	79
E	18	78
	1	78
E	5	76
E	3	76
E	20	75
E	4	64
E	7	61
E	17	56
	Mean	82.3
	Std. Dev.	9.4

Experimental Class

	Student No:	Second Period Scores (%)
	2	97
	13	97
	9	95
	11	93
	6	93
	8	93
	16	92
	14	92
E	3	91
E	15	91
	12	90
E	19	89
E	20	89
	21	87
E	18	85
	1	78
	10	77
E	5	76
E	7	72
E	4	69
E	17	67
		86.3
		7.7

Experimental Class

	Student No:	Third Period Scores (%)
	2	94
	13	94
	6	94
	11	94
E	3	94
	9	93
	8	93
E	15	93
	12	93
E	19	93
E	20	91
E	18	91
	16	90
	14	90
	21	90
	10	88
E	5	89
	1	83
E	17	75
E	7	74
E	4	74
		89.1
		4.6

C - Control group student

E - Experimental group student

Reading Scores of Control Group and Experimental Group

Table V

Control Group

Student No:	First Period Scores (%)	Second Period Scores (%)	Third Period Scores (%)
1	77	71	83
2	71	67	66
3	77	67	73
4	72	71	73
5	78	76	71
6	88	78	68
7	71	73	76
Mean	76.3	71.9	72.9
Std. Dev.	4.2	3.3	3.9

Experimental Group

Student No:	First Period Scores (%)	Second Period Scores (%)	Third Period Scores (%)
1	76	91	94
2	64	69	74
3	78	76	89
4	61	72	74
5	83	91	93
6	56	67	75
7	78	85	91
8	79	89	93
9	75	89	91
Mean	72.9	81.3	86.6
Std. Dev.	8.2	8.2	6.9

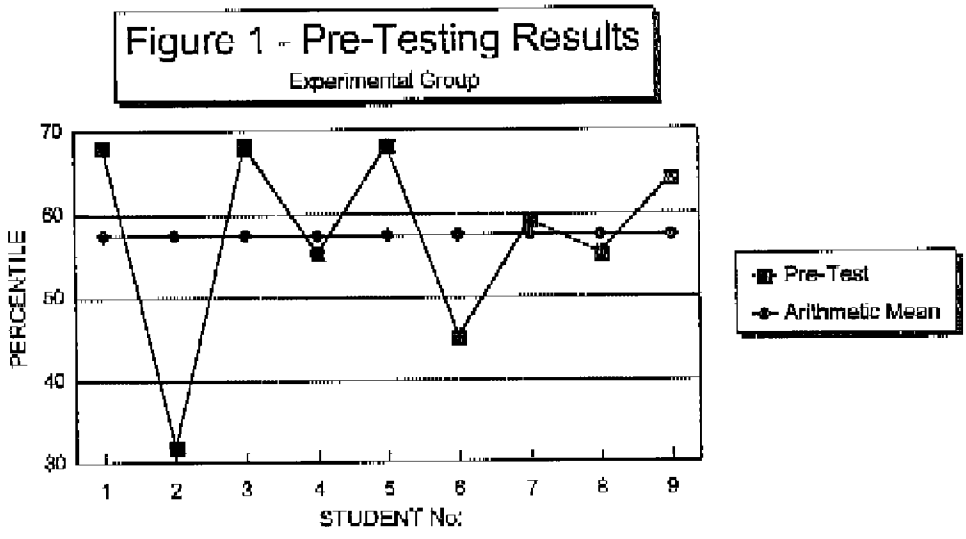


Figure 1 presents the pre-test scores of the experimental group as compared to the arithmetic mean. The range of scores is 32% to 68%.

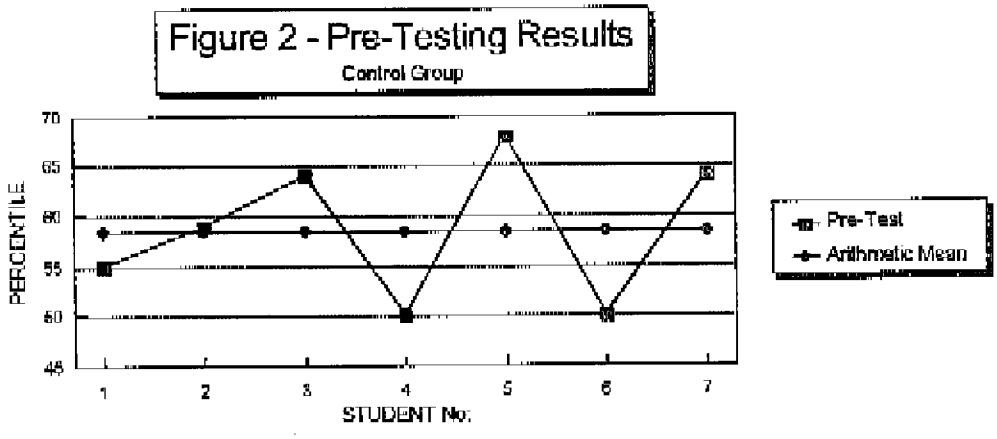


Figure 2 presents the pre-test scores of the control group. The arithmetic mean score was 58.4% with a standard deviation of 7.1%. The range of the scores was 50% to 68%.

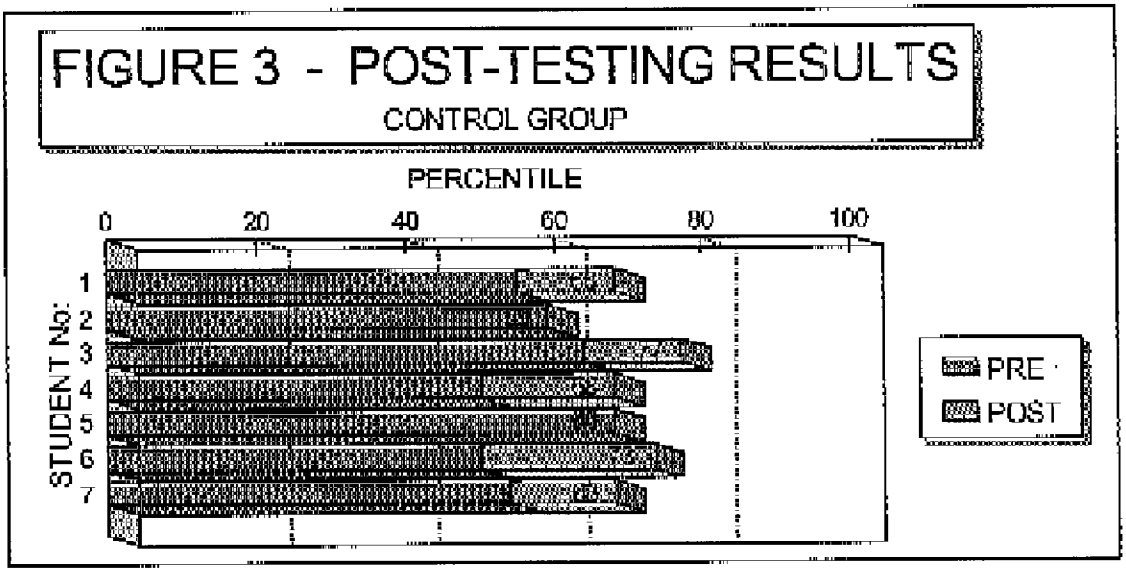
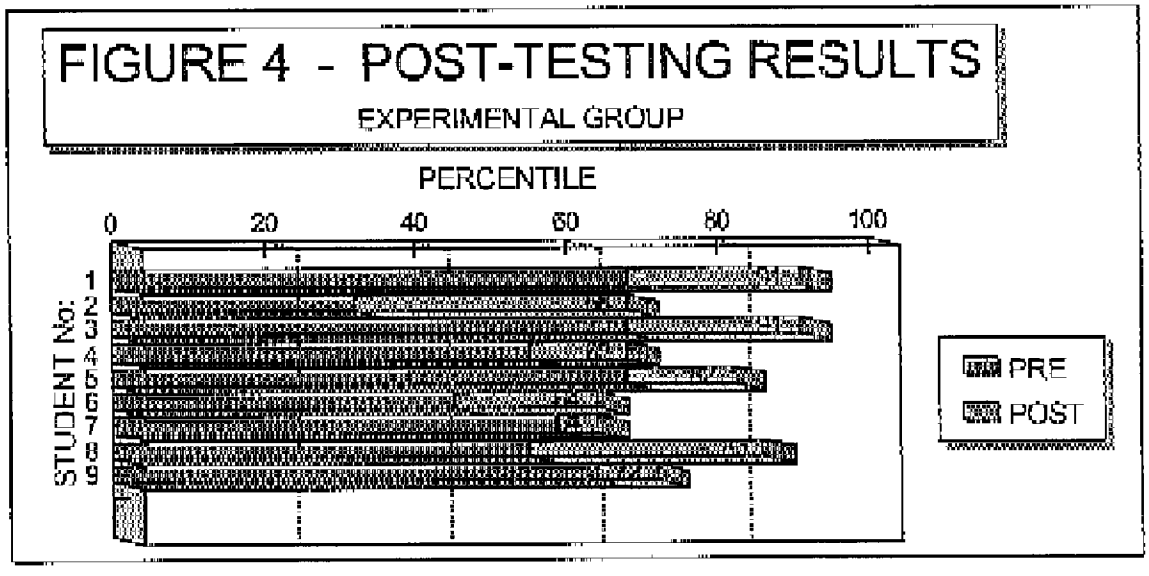
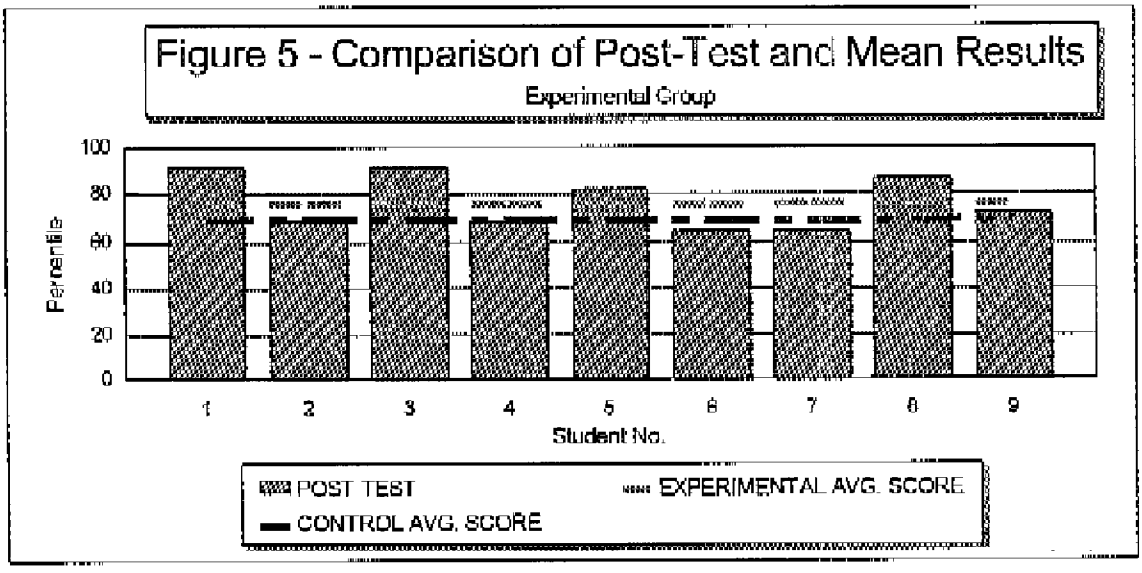


Figure 3 presents the control group post-testing scores. The results showed the pre-testing and the incremental improvement. All students did the same or better in the post-test.

Figure 4 below presents the experimental group post-testing results. The pre-test scores and the incremental improvements are shown. The scores ranged from 64% to 91% (standard deviation = 11.3%). The range of improvement was 5% to 36%.





Comparison of the experimental group post-test scores verses the post-test arithmetic mean of each group is presented in Figure 5. The experimental group's mean score improved 18.7% (75.9%-57.2%). The control group's mean score improved 10.6% (69.0%-58.4%). The ratio of improvement of the experimental group to the control group is 18.7% /10.6%.

Chapter Five

Summary

This study examined how phonemic awareness affects reading ability with at-risk students on the primary level. Subjects were second grade students at a rural school in Westmoreland County in Hague, Virginia. Students of two different classes were administered a pre-test (Yopp-Singer Test of Phoneme Segmentation). Students scoring below 70% were selected for the study. The control students were from another class and the experimental students from my class. The experimental group was composed of nine students and the control group was composed of seven students. Children in the experimental group received 30 minute sessions each day for ten weeks of phonological activities within the normal reading curriculum. Findings suggest that both groups scores increased on the post-test. Although, the experimental group showed greater improvement than the control group. This significant improvement reflects that training in phonemic awareness increases the ability for the at-risk students to decode. Decoding is a fundamental building block in reading. Increased reading scores during each grading period reflected how phonemic awareness effected students' reading capabilities.

Conclusion

At-risk students usually lack phonemic awareness. This study reinforces that teaching of basic sound and decoding skills will significantly improve the capability of such students in word segmentation and blending unknown words. Research reinforces how phonemic awareness increases the measure of alphabetic reading and general verbal

ability as stated in Torgesens's study (1992). Phonological processing does enhance the reading ability in terms of applying known skills to new vocabulary.

Discussion and Implications

This study determined whether phonemic awareness affects reading ability with at-risk students on the primary level. The subjects of the study could have been at-risk due to the following aspects:

- natural habitat
- level of vocabulary
- reading readiness skills
- poor usage and pronunciation of the English language

Students had a deficit in at least two or more of the areas listed above. Sixty-seven percent of the subjects were African American and from a low socioeconomic status. These students tend to have weaker phonemic awareness skills. Juel (1988) had also observed these two factors in her study. The reading ability of these students ranged from one to two years below the second grade level. This intervention had positive effects on the students and involved the following program.

These steps of the program involved:

- developed initial, medial, and ending sounds; blending skills; rhyming skills; analysis and synthesis skills; in a relaxed game oriented structure
- emphasized one skill a week for four weeks and challenged subjects by combining skills in game like activities

- used skills in game type atmosphere with "hands on"

interaction

Test results suggest that the intervention was successful. The experimental group had a 18.6% mean increase on the Yopp-Singer post-test. Control group had a 10.6% mean increase. Both groups began on the same level as indicated by the difference of mean pre-test scores being within 1.2%. The results of this testing suggest that the regular reading/language program has lacked effectiveness. The control group did not score above the 77th percentile, and also had two students that showed no improvement during the ten week period. On the other hand, six students in the experimental group had increased their scores to the 80th percentile or higher on the post-test.

Some other studies have reflected the same or greater increases in phonemic awareness with phonological awareness interventions. Research has been supportive of phonological training in the early primary grades. Torgesen (1992) stated that high performance in phonological analysis and synthesis tasks are highly correlated with the acquisition of reading skills. Mann (1989) and her colleagues found that kindergarten children who gave phonologically accurate spellings were better first grade readers. These studies support the fact that phonemic awareness increases reading capabilities.

Reading scores for each class and the observed groups are presented in Table IV and V. Each period was a duration of nine weeks. The first period (September - mid November) was prior to the phonemic awareness intervention. Both control and experimental groups started from the same base using a regular reading/language curriculum described in Chapter 3. The second period (mid November - end of January)

entailed the regular reading program including the reinforcement of additional basic reading skills within the experimental class. The phonemic awareness intervention began in the middle of the second period and continued through middle of the third period (end of January - early April).

Prior to the intervention, both control group and experimental group had started from the same baseline. The difference in mean reading scores was 3.4 in the first period. During the second period, additional basic skills were reinforced along with the regular reading/language program. The phonological awareness intervention occurred during the middle of the second period.

The experimental group's reading scores increased significantly for each period. There was an 8.4 point increase from the first period to the second period and a 5.3 increase from the second period to the third period. The group increased a total of 13.7 points.

The control group's mean score kept decreasing between each period. The overall mean score decreased by 3.4 points. The mean score (72.9) of the control group during the third period was the same mean score of the experimental group during the first period. Test results show that the phonological awareness intervention was successful in enhancing students reading ability.

The experimental group was explained the improvements they made on post-test compared to that of pre-test. Post intervention, these students were not hesitant to sound out new or unknown words. They attacked words more aggressively even though they

did not always say the correct response. Students applied this skill because they were able to use them readily and successfully.

One implication of this study was the usefulness of phonological skills. Once the students had obtained the skills, they were able to apply and utilize them. If these skills were not developed in school or in another educational setting, they may not be learned elsewhere. Phonological skills should be obtained preferably in kindergarten and first grade, but no later than second grade or students become at-risk. Juel (1988) stated that phonics instruction is not effective unless children have some phonemic awareness at the beginning of first grade. It is initially the administration's initiative to implement phonemic awareness skills within the curriculum for students to be successful in reading.

Recommendations

The results of the phoneme segmentation test suggest that with supplemental phonological activities for even a short duration, scores will significantly increase. Results would also suggest that within two ten week sessions all scores would be above the 70th percentile. The study shows strong support for phonemic awareness activities to be a mandated segment of an early reading program for minority and at-risk primary grade children. Phonemic awareness skills assist students to decode unknown words and increases their reading capabilities.

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